

Date: Wed, 25 Aug 93 04:30:19 PDT  
From: Ham-Homebrew Mailing List and Newsgroup <ham-homebrew@ucsd.edu>  
Errors-To: Ham-Homebrew-Errors@UCSD.Edu  
Reply-To: Ham-Homebrew@UCSD.Edu  
Precedence: Bulk  
Subject: Ham-Homebrew Digest V93 #21  
To: Ham-Homebrew

Ham-Homebrew Digest                      Wed, 25 Aug 93                      Volume 93 : Issue    21

Today's Topics:

    "Julieboard" info (2 msgs)  
    Combining filters to make a bandpassRe:  
        DTMF decoder and dopler circuits  
        How to make one (was: SWR Meters)  
    INSTRUCTION/OPERATORS MANUALS up for grabs  
        MARS frequencies  
        Packet Modem Kits  
        SWR Meters (2 msgs)  
        Tx/Rx Interference?

Send Replies or notes for publication to: <Ham-Homebrew@UCSD.Edu>  
Send subscription requests to: <Ham-Homebrew-REQUEST@UCSD.Edu>  
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Homebrew Digest are available  
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-homebrew".

We trust that readers are intelligent enough to realize that all text  
herein consists of personal comments and does not represent the official  
policies or positions of any party. Your mileage may vary. So there.

-----  
Date: Tue, 24 Aug 93 13:03:01 GMT  
From: mnemosyne.cs.du.edu!nyx!lkollar@uunet.uu.net  
Subject: "Julieboard" info  
To: ham-homebrew@ucsd.edu

bills@inqmind.bison.mb.ca (Bill Shymanski) writes:

>the blank board is \$33, an assembled and tested unit is \$160 with a  
>33 MHZ synthesizer in it, and the "partial kit" with pcb, manual, filter,  
>and DDS chip is \$115.

Ouch! Ouch! Does that seem a bit steep to anyone else (even accounting  
for Canadian/US exchange rates and small quantities)? Add 7%, and we're  
up to \$123 plus a nickel.

To be fair, I haven't priced out the parts yet -- but I have an issue of Computer Craft at home with an article on a 1-10 MHz frequency synthesizer for about \$50. I'll dig it up and post the issue date if there's any interest.

Sorry Julie, but I think I'll pass. :-)

--

Larry Kollar, KC4WZK | I like CW, but that doesn't mean I think every ham  
lkollar@nyx.cs.du.edu | should have to learn it.

"You mean you came back from the dead, to tell me I'm \*odd\*?"

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Date: Tue, 24 Aug 1993 17:56:49 GMT  
From: dog.ee.lbl.gov!overload.lbl.gov!agate!howland.reston.ans.net!math.ohio-  
state.edu!cs.utexas.edu!csc.ti.com!tilde.csc.ti.com!ra.csc.ti.com!  
fstop.csc.ti.com!linnig@network.ucsd.edu  
Subject: "Julieboard" info  
To: ham-homebrew@ucsd.edu

In article <1PeR9B2w165w@inqmind.bison.mb.ca> bills@inqmind.bison.mb.ca (Bill Shymanski) writes:

>  
> I just got a (paper) letter from the author of the Julieboard article;  
> the blank board is \$33, an assembled and tested unit is \$160 with a  
> 33 MHZ synthesizer in it, and the "partial kit" with pcb, manual, filter,  
> and DDS chip is \$115. All prices in \$ Canadian, and add \$5 or so for  
> shipping. Oh, and 7% contribution to reducing the national debt.

Just checked the exchange rate. A U.S. Dollar will buy you 1.31 canadian dollars.  
That works out to:

- o The blank board is \$33 (\$25 U.S.)
- o An assembled and tested unit is \$160 (\$122 U.S.)
- o The "partial kit" is \$115 (\$88 U.S.)

Not quite so bad.

-- Mike, N5QAW

Mike Linnig, Texas Instruments Inc.		97.43% of all statistics are made	
Phone: (214) 575-3597		up; most of them (83.6 percent)	
Internet: mike.linnig@dseg.ti.com		are wrong.	

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Date: Wed, 25 Aug 1993 01:25:35 GMT  
From: swrinde!cs.utexas.edu!csc.ti.com!tilde.csc.ti.com!mksol!  
blair@network.ucsd.edu  
Subject: Combining filters to make a bandpassRe:  
To: ham-homebrew@ucsd.edu

John Welch (jjw@seastar.org) wrote:

: I'm looking for a way to put 2 filters in series, a high-pass and a  
: low-pass, to make a wide bandpass RF filter. When I just plugged one  
: into the other, it seemed to not work even though each individual  
: filter did work.

: I would like to use this as both an output and input filter, running  
: upwards of 20 watts through it. Should I put an isolation transformer  
: (1:1) in the middle? Any help would be appreciated.  
: -->jjw

: --

: John Welch, N9JZW

Filters hate to be cascaded. The easiest way to make them behave  
is to put an attenuator between them (resistive) as long as you  
can afford the loss. 3dB should be enough. Otherwise use an isolation  
amp. I don't think a transformer will do it, but then I never tried.  
Art.

-----  
Date: Tue, 24 Aug 1993 16:26:34 GMT  
From: sdd.hp.com!portal!lhaven.UUmh.Ab.Ca!combdyn!lawrence@network.ucsd.edu  
Subject: DTMF decoder and dopler circuits  
To: ham-homebrew@ucsd.edu

I'm looking for sources of circuits describing construction of tone alert  
modules and Dopler systems.

Two reasons.

I want to build a module that I can plug into the earphone jack of my HT (or  
scanner), to listen for "Long Tone Zero" being sent out over the main city  
repeater. That way I don't have to have the speaker nattering at work  
(especially when you deal with co-workers that don't like noise) all the time,  
but I can hear get some kind of signal when somebody needs help. Actually, it

might not be "Zero" that we use as the alert tone, but it'll be a DTMF digit of sometype. The module should give both audible and visual indication, and either time out or be resetable.....8-)

The other project is to hunt for a ghost in our city. He's constantly kerchunking all the repeaters in town, keying over top of people, jamming, playing with the Link and the autopatch. He never talks on the air. And, he doesn't stay on for very long....so we can't sniff him out. So, we want to throw together some dopler systems quickly to get an idea of where he's at.

--

--EMAIL-----PHONE-----FAX-----  
| WORK: lawrence@combdyn.com | (403)529-2162 | (403)529-2516 | CallSign  
| HOME: dreamer@lhaven.uumh.ab.ca | (403)526-6019 | (403)529-5102 | VE6LKC  
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disclamer = (working\_for && !representing) + (Combustion Dynamics Ltd.);

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Date: Tue, 24 Aug 1993 22:02:49 GMT  
From: mcsun!sun4nl!relay.philips.nl!philica!geertj@uunet.uu.net  
Subject: How to make one (was: SWR Meters)  
To: ham-homebrew@ucsd.edu

alanb@sr.hp.com (Alan Bloom) writes:

>"Eleen N. Kamas" (ee2g+@andrew.cmu.edu) wrote:  
>:  
>: I have a SWR meter that was designed to be used for HF frequencies.  
>: Is it possible to modify it to work on 2 meters?  
>Try it! I have found that many of the cheap SWR meters work passable  
>well on 2 meters as-is. If it reads close to 1:1 into a good 50-ohm load,  
>and reads infinity into an open circuit, then it is probably usable.

If the SWR 'engine' isn't usable (in my experience, it usually isn't), you could try to make a new engine. I did something like:

1. Take a small piece of RG213 (or other, requirements are cable as thick as possible; solid dielectricum, woven braid)
2. Gently remove the outer isolation (gently! has to be put back later on) Cutting on the length side of the cable gives best results.
3. Push the outer braid in (like a harmonica), so the inner diameter raises and the solid inner coax cable can be easily removed;
4. Put two thin, isolated wired wires (e.g. teflon 'wire wrap' wire) in parallel to the inner conductor of the coax (the part you took out in step 3); the ends of the wire should be accessible later
5. Re-apply the braid you took out in step 3. Make shure that the 4 ends of the wire you added remain accessible; peel them trough the braid.

Make shure that you re-apply the braid as neatly as possible; the impedance of the coax is determined by this and thus the accuracy of your instrument!

6. Re-apply the outer isolation as neatly as possible. This helps to improve your work from step 5. Make provisions for the wires you added.
7. Put the coax between the two connectors of the original SWR casing. \*NEATLY\*. No pigtails please; make it in a VHF fashion. The accuray of your device is determined by the impedance of it; the 'modified' coax and the connection to the connectors will disturb the impedance of the unit and that should be as less as possible!
8. Hook up the two sense wires as in the original scheme: on the left, a trimming pot on wire 1 and a diode detector on wire 2; on the right, another diode detector on wire 1 and a trimming pot on wire 2 (thus, cross).  
The original unit probably has long wires to a PCB containing these components in the original setup; this is no longer possible (remember, we're talking VHF). Apply them in such a way that the VHF 'hot' sense wires are as short as possible (a few mm's at most). The DC wires (the output of the detectors) is, of course, much less of a problem.
9. You probably should swap the diodes originally used in the detectors for something better. Use low-voltage drop diodes; schottky or such. I have used OA91 diodes but they are probably not known in the USA. They are low-capacity, high-speed, low-drop detector diodes for AM video signals (at worst, you have to take them out of 2 TV sets; as an added bonus, the other components are now also available for other projects :-)

Then, wire the rest of the SWR meter as you normally do, and adjust the two puts on the sense wires.

On short, what you have done is added two sense wires to a piece of coax. That piece of coax has to remain 'coax' as much as possible, hence my emphasis on \_short\_ wires. The better the coax is restored to its iriginal form, the better the meter. (that is why I advised \*thick\* coax; the changes have less impact on the characteristics of this than on thin coax).

This, of course, doesn't make up for a bird meter. It also doesn't cost nearly as much. I used one in my student years; I only replaced it a year ago when I needed something for higher frequencies, was too lazy to build it, and got away with it because I now could afford to buy one instead :-).

This makes up for a nice weekend project. You probably ruin the first piece of coax; since only small lengths are involved, that's no problem.

Hope this helps, 73,

Geert Jan, PE1HZG

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Date: 24 Aug 93 21:57:12 GMT  
From: news.service.uci.edu!mothra.nts.uci.edu!lockhart@network.ucsd.edu  
Subject: INSTRUCTION/OPERATORS MANUALS up for grabs  
To: ham-homebrew@ucsd.edu

On Date: 8 Aug 93 00:11:44 GMT I wrote: I have the following  
INSTRUCTION/OPERATORS MANUALS up for grabs:

NOTE: "Some manuals are still unclaimed."

HY-GAIN THUNDERBIRD (TH3Mk30 THREE ELEMENT HAM ANTENNA  
Still up for grabs

HY-GAIN BALUN MODEL No. BN-86  
Still up for grabs

CDE HAM II ROTOR  
Original still up for grabs if I don't get an immediate SASE  
from Robert Wise, WB5KXH  
Photocopy sent to: Russ Schroeder, W2DYY

HY-GAIN 18HT HY-TOWER 10-80 METER:  
Sent to: Doug Snowden, N4IJ

SPECTRONICS DD-1C DIGITAL FREQUENCY DISPLAY (used in conjunction with  
the COLLINS KWM2/2A  
transceivers).  
Sent to: Gary Bishop, NQ0V

All items below sent to: Steve Miller, KD2ED. Steve said he'd be more  
than happy to photocopy manuals for anyone else. Just send him an  
SASE.

COLLINS KWN-2 and KWM-2A TRANSCIEVERS

COLLINS 312B-4 & 312B-5 STATION CONTROLS

COLLINS SM-3 MICROPHONE

MAGNUM SIX RF SPEACH PROCESSOR

All INSTRUCTION/OPERATORS MANUALS are in various states of condition.

[illegible]

-----  
Date: 24 Aug 93 21:38:37 GMT  
From: timbuk.cray.com!walter.cray.com!rps@uunet.uu.net  
Subject: MARS frequencies  
To: ham-homebrew@ucsd.edu

It's just like the federal Government, "You can't know something unless you already know it".

I find it interesting that you can't join MARS unless you have a radio that can work 2 of their HF frequencies yet you can't modify your radio to work these frequencies unless you have a MARS call sign. :-)

MARS (Military Affiliate Radio System) Frequencies.

Here is a list of frequencies given to me in a pamphlet sent by the Airforce MARS chief. Frequencies in brackets were derived from other sources. It would be nice to have this added to the FAQ. :^)

-----  
+ Air Force MARS +  
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HF - 3190.5 kHz  
HF - 4590.0 kHz  
HF - 4832.0 kHz  
HF - 7313.5 kHz  
VHF - 49.980 MHz  
VHF - (148.125 MHz packet)  
VHF - 143.45 [(-1.3 split)], and other VHF Freqs.

-----  
+ Army MARS +  
-----

HF - 3348.5 kHz  
HF - 6997.5 kHz  
HF - 14403.5 kHz  
HF - 40.95 MHz  
VHF - 143.99 MHz [? Split] and Other VHF Freqs.

-----  
+ Navy-Marine MARS +  
-----

HF - 3190.5 kHz



HF - 4042.5 kHz, (4003.5 kHz)  
HF - 7382.5 kHz, (7363.5 kHz, 7500 kHz)  
HF - 13975.5 kHz  
HF - 14385.0 kHz  
HF - 20998.5 kHz  
VHF - 148.375 MHz [? split],  
VHF - 148.975 MHz [? split], and other VHF Freqs.

-----  
Date: Tue, 24 Aug 1993 14:05:02 GMT  
From: pravda.sdsc.edu!news.cerf.net!usc!howland.reston.ans.net!vixen.cso.uiuc.edu!  
milo.mcs.anl.gov!chbmac01.el.anl.gov!user@network.ucsd.edu  
Subject: Packet Modem Kits  
To: ham-homebrew@ucsd.edu

Our club will be putting out some kits based on a modified  
'baycom' type design. These will be cheap, around \$30. They  
should be available soon. Anyone intested?

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-----  
"If I told you all that went down, it would burn off both your ears..."  
-Robert Hunter/Jerry Garcia

-----  
These thoughts are only my own. CHBeck@anl.gov

-----  
Date: 24 Aug 93 19:39:33 GMT  
From: ogicse!hp-cv!sdd.hp.com!col.hp.com!news.dtc.hp.com!srngenprp!  
alanb@network.ucsd.edu  
Subject: SWR Meters  
To: ham-homebrew@ucsd.edu

"Eleen N. Kamas" (ee2g+@andrew.cmu.edu) wrote:

:  
: I have a SWR meter that was designed to be used for HF frequencies.  
: Is it possible to modify it to work on 2 meters?

:  
Try it! I have found that many of the cheap SWR meters work passable  
well on 2 meters as-is. If it reads close to 1:1 into a good 50-ohm load,  
and reads infinity into an open circuit, then it is probably usable.

AL N1AL

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Date: 24 Aug 93 12:58:57 EDT  
From: world!ksr!jfw@uunet.uu.net  
Subject: SWR Meters  
To: ham-homebrew@ucsd.edu

ee2g+@andrew.cmu.edu (Eleen N. Kamas) writes:

>I have a [Rat Shack] SWR meter ... designed to be used for HF frequencies.  
>Is it possible to modify it to work on 2 meters?

Not likely, not without gutting it and replacing the electronics entirely. SWR meters below 30 MHz usually use a toroidal sense transformer whose sensitivity drops with frequency; my Heathkit SWR meter came with a second toroid for those who wanted to build it as a 6-meter (only) version. 144MHz is high enough that you really start having to worry about parasitic inductance and capacitance, and the usual scheme is difficult to make work. However, there is a scheme that takes advantage of parasitic inductance for VHF SWR meters (called the Monimatch); probably some version of the ARRL Handbook has it (go buy one, now, just on general principles), though the 1984 copy I keep in my office doesn't. The Monimatch is essentially a transmission-line transformer built on epoxy circuit board.

>

> If someone would like to wax-eloquently on what exactly a SWR meter  
>is really measuring in term that this Electrical Engineer can understand,  
>I sure would appreciate it.

>

If you \*really\* want your eloquence waxed, go buy a copy of Maxwell's "Reflections", sold by the ARRL (in fact, buy one even if you DON'T), but here goes: an SWR meter measures the power going to the load and the power reflected back down the transmission line by the load. (Well, OK, it usually measures the voltages, but that's just a detail.) Some meters use a bridge scheme to obtain a ratio of the two to directly read SWR (which is equal to  $(V_f + V_r)/(V_f - V_r)$ ), others just display forward and reverse power and let you figure it out (very fancy meters use crossed needles on one meter face to allow you to read forward and reverse power WHILE directly reading SWR). Where does the reflected power come from? While the forward wave is travelling up the line, it has a definite voltage and current whose ratio is set by the characteristic impedance of the line; each successive bit of the line "accepts" the power from the previous bit and offers it the same ratio. When the power hits the load, if the load has the same characteristic impedance, then it can accept all the power presented; if not, however, then suddenly  $V/I$  no longer equals  $R$ , and something has to give; the load wind up accepting some of the power, and the rest reflects back down the line, possibly with a phase shift as well. When that reflected wave hits the generator (in the case of a transmitter, the generator's impedance is usually not even close to the characteristic impedance it wants to see presented to it), the power entirely (or nearly so) reflects back toward the load, cycling back and forth until cable losses make it vanish.

The job of a Transmatch, by the way, is not to make the antenna's impedance equal to 50 ohms (which it can't unless it is physically located at the antenna feedpoint); it is to present the transmitter with a 50-ohm load (a 50-ohm transmission line with a mismatched load will have an effective impedance of something other than 50 ohms). Most solid state transmitters generate power most efficiently when presented with their design impedance, and contain high-SWR shutdown circuitry to avoid burning up by inefficiently generating RF power when presented with the wrong load.

John, WB7EEL/1

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Date: 25 Aug 93 01:00:51 GMT  
From: psinntp!cooper!mark@uunet.uu.net  
Subject: Tx/Rx Interference?  
To: ham-homebrew@ucsd.edu

> If the transmitter is relatively low power, as we would assume,  
> then a simple lumped constant duplexer could allow sharing of  
> the single antenna wire. At low power levels, 10 mw or so, the  
> duplexer could be kept under a couple of ounces. A 3 MHz split  
> is easily possible.

Well, it is my understanding that the receivers used for radio controlled airplanes are usually not of the best technology. My receiver/transmitter is an FM unit, so it's not among the worst out there. Still, others have voiced concern that there would be significant interference. I do not know what the transmitter's output is, but I think it's much higher than 10mw. These xmitters are good to a mile on a good day (not that you let an airplane get nearly that far away!).

Would any interference between 75 MHz and 72 MHz be reduced if the split was 72 MHz and 27 MHz?

Thanks!

;  
; Mark Balch                                   The Cooper Union  
; mark@alf.cooper.edu                       (212) 353-4350  
; mark@magnum.cooper.edu                   The Future is MPP!  
;

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End of Ham-Homebrew Digest V93 #21

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